-glucan-induced stimulation in common carp (Cyprinus carpio) during tissue regeneration

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B-glucan-induced stimulation in common carp (*Cyprinus carpio*) during tissue regeneration

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The response to pathogens and damage in vertebrates involves a series of organized and highly evolved molecular mechanisms leading to pathogen specific immune reactions and tissue regeneration as the wound healing process. Pathogen and damage-associated molecular patterns (PAMPs and DAMPs) rely on pattern recognition receptors (PRRs) and downstream signalling pathways, promoting immune reactions. During the last years, the ability of β-glucans to modulate immunity through activation of innate cellular components has been observed. However, toxicological effects associated with the systemic administration and dose-related immune-suppression has also been described.
The superior aim of this study is to understand the effect of β-glucan induced modulation in carp in relation to tissue regeneration and the subsequent effects relating to the filet as a product.
A comparison in modulation between immune cells (Macrophages) and tissue related cells (Fibroblasts) will be evaluated. Parameters as respiratory burst activity and expression profiles of immune related genes will be measured in cell cultures and in *in vivo* experiments.
The methodology of the project involves the creation of protocols for extraction of damage-associated molecular patterns, handling and maintenance of cellular cultures, application of protocols for quantification of respiratory burst and the usage of real-time quantitative PCR to quantify expression of genes of interest (IL-1β, IL-10, IL-8, TNF-α, TGF-β, COL-1A, MMPP9, FGFs and IGFs).
This study will provide further understanding on the effect of β-glucan as a modulator, which could improve fish welfare and health as well as having an economic potential for the production in aquaculture industry.

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